# *LAND USE*

## HISTORICAL LAND USE (UPPER SUBBASIN)

Jacobson and Primm (1994) gave a detailed account of the historical land use of the Ozark Plateau, which is outlined in this section. The headwaters of the St. Francis River basin have undergone the same type of land disturbances that are typical of the Ozark Plateau. Suppression of wildfire was followed by mining, highly selective upland logging, annual burning to support open range for grazing, transient attempts at upland row cropping, a second intensive timber cutting concentrated on the slopes, and most recently, increased grazing intensity.

Prior to the 1800s, the subbasin was in the historic pine range -- a wildfire-maintained upland savannah dominated by shortleaf pine with a prairie grass understory. The steep valley walls grew lush forests of oak, hickory, and pine, while the valley bottoms produced dense stands of bottomland hardwoods.

Early prospectors mined mineral deposits (lead, zinc, silver, iron) on the slopes of the St. Francois Mountains. During the early settlement period (1800-1880) settlers raised crops in the valleys and grazed livestock on the forested hillsides and the natural grass of the uplands. Small logging operations selectively cut old growth timber in the uplands and a network of roads was developed. Land disturbances caused by early settlement had minimal effect on runoff and erosion.

During the timber boom (1880-1920), large-scale timber operations began. Many settlers moved to the region for jobs. Log drives down streams could be large and logs were not tied into rafts. In 1909, Missouri began regulating log drives because they were dangerous and damaged stream banks. By 1920, most of the marketable shortleaf pine and hardwoods had been cut and the larger mills ceased operation.

Many of the unemployed loggers and lumber mill workers settled on the cut-over land vacated by the departing timber companies. Indiscriminate logging took more, the remnant forest was burned each year to increase grass production, livestock over-grazed the newly converted range land, and bottomland agriculture (row crops and livestock) expanded.

Agriculture peaked from 1940 to 1950, then decreased. Passage of an open range law, fewer range fires, acquisition of public lands, improved soil conservation practices, and reforestation of marginal pasture and row crop acreage all contributed to improved watersheds.

## HISTORICAL LAND USE (LOWER SUBBASIN)

The entire Bootheel region of Missouri (which includes the lower subbasin of the St. Francis River) has undergone a total landscape transformation from an immense swampland forest, with intermingled streams, lakes, swamps, bayous, and sloughs, to a vast agricultural area.

This conversion to agriculture required more than 200 years and three extensive land disturbances: drainage, clearing, and flood control. Major drainage and flood control projects were aided by direct and indirect government involvement in planning and construction. This included levees, Wappapello Lake and other storage reservoirs, Headwater Diversion Channel, floodways, cutoffs, ditches, pump stations, and mainstem channelization. Clearing was dependent on successful drainage and flood control programs. Reclamation clearing was accomplished by private enterprise (logging followed by agriculture) on drained lands, with government encouragement through land grants, land promotions, price supports, liberal allotments, and special subsidies. Land reclamation was, at first, a slow and difficult process. In 1912, just four percent of the Bootheel forests had been cut (MDC 1989). By 1989, however, only 10 percent of the forests remained and 96 percent of the wetland acres had been drained (USCOE 1991). The development of modern machinery greatly accelerated land reclamation, especially between 1950 and 1970.

## RECENT LAND USE (UPPER SUBBASIN)

This subbasin is 77 percent woodland, 10 percent grassland, 7 percent cropland, and 6 percent other land uses, which includes industrial, urban, and water developments (MDNR 1984)(Figure lu**)**. Small cropland tracts are most often restricted to the wider mainstem floodplains in St. Francois County, while grasslands (hay fields and pasture) tend to be associated with bottoms and cleared ridge-tops in Iron, Madison, and Wayne counties. Land use patterns have apparently stabilized.

The woodlands are usually large upland tracts of oak-hickory forest dominated by a black-scarlet oak association (45%) and a secondary white oak association (31%). Succession is toward conversion to a more desirable white oak forest type. The tracts are considered moderately (56%) to poorly (26%) stocked with proportional stand size-classes of 49 percent sawtimber, 33 percent poletimber and 18 percent seedlings and saplings (Leatherberry 1990). Most of the woodlands (71%) are privately owned; 19 percent are under state or federal stewardship. Livestock grazing in woodlands can present some ecological and hydrologic concerns relating to canopy closure, understory development, leaf litter accumulation, and soil compaction.

A local mining industry (iron, lead, zinc, quarried red granite) and various small urban centers provide important components of the basin's economy. Small farms are common throughout the basin, but most farm operators supplement their incomes with off-farm employment.

The subbasin is mostly rural and sparsely populated (MDNR 1986). The communities of Farmington, Fredericktown, and Ironton and the area surrounding Wappapello Lake are experiencing the greatest population growth. Uncontrolled sediment and stormwater runoff at construction sites can pose localized problems. There are no industrial developments, associated with the small urban centers, that pose serious threats to local streams.

## RECENT LAND USE (LOWER SUBBASIN)

Land use patterns (clearing and reclamation) stabilized after the most recent flood control (major levees) and drainage (mainstem channelization) projects were completed during the early 1970s. Presently, the subbasin is 90 percent cropland and pasture (predominately row crop) and only 10 percent forest (MDNR 1984) (Figure lu**)**. Agriculture is the most important industry in the subbasin as indicated by the high percentage of cropland. No significant change in land use is expected in the future. Woodland conversion to cropland is dependent on additional drainage, which is now seldom economically feasible because the woodlands are widely scattered and newly enacted legislation.

The remnant woodlands are old growth oak-gum-cypress forest types that occupy low, moist soil sites. Wooded tracts are considered poorly stocked with proportional stand size-classes of 92 percent sawtimber, 7 percent poletimber, and only one percent seedlings or saplings (Hansen 1991). Most of the woodlands are now under state or federal stewardship; 28 percent of the woodland resource remains in private ownership.

The larger, wide-based levees throughout the subbasin are often used to produce hay crops. Sometimes the smaller, steeper-sloped levees are fenced and used as seasonal pasture for livestock (Norman 1973).

The subbasin has a sparse population concentrated in the small communities of Bloomfield, Puxico, Cardwell, Puxico, Arbyrd, Dudley, Qulin, and western Dexter (MDNR 1986a). Some of these communities are located on the vulnerable inside portion of the setback St. Francis River Levee, but are protected from flooding by secondary levee systems. There are no industrial developments associated with these small, suburban communities that pose serious threats to local streams and drainage ditches.

## SOIL CONSERVATION PROJECTS

The upper subbasin contains three completed small watershed Special Area Land Treatment projects (SALT) and one completed large watershed EARTH project.

> VILLAGE CREEK SALT (Project Number S-159), a 3,845-acre treatment area in the Little St. Francis River watershed in northeast Madison County, was conducted from 1994-1999 by the Madison County Soil and Water Conservation District (SWCD). The project addressed sheet and gully erosion on woodlands, pasture, and streambanks through livestock fencing, rotational grazing, re-seeding, and pond construction. Landowner participation was considered light. Accomplishments included treating 1,442 acres of grassland (over-seeded and fertilized), fencing 124 woodland acres to exclude livestock, building five ponds to stop gully erosion, and developing four springs (Selma Mascaro, Madison County SWCD, Personal Communication).
>
> PEACHTREE FORK SALT (Project Number S-136), a 3,241-acre treatment area in the Clark Creek watershed in northwest Wayne County, was conducted from 1993 to 1998

with variable funding from the Wayne County SWCD. The project addressed sheet and gully erosion, primarily on woodlands and pasture, and some cropland acreage through livestock fencing, rotational grazing, re-seeding, cropland rotation, and dry-hole pond construction. Incentives included special rental rates for a seed drill and 75 percent cost sharing for seed, fencing, and pond construction. Landowner interest was low; only 391 acres were adequately treated and most of this was on woodlands (Tom Johnson, Wayne County NRCS, Personal Communication).

FLATWOODS SALT (Project Number S-020), a 2,908-acre treatment area in the Rock Creek watershed in east Iron County, was started in 1988 and terminated in 1991 after a total expenditure of $35,000 by the Iron County SWCD. The project emphasized woodland stewardship and sheet and gully erosion on pastures through proper planning of timber harvest, re-seeding, and pond construction. The project resulted in a number of completed farm plans, about 1,075 acres of pasture re-seeded with warm and cool season grasses, one gully control structure installed, and a spring-fed watering tank for livestock. Livestock fencing was not an approved practice. Thirty-four out of 75 eligible landowners took advantage of the free use of a seed drill, but did not often apply for cost-share seed benefits (Edward Templeton, Iron County NRCS, Personal Communication).

CRANE POND CREEK EARTH (Project Number E-023), an 11,164-acre treatment area in east Iron County, was conducted from 1994 to 1999 by the Iron County SWCD. The goal of the EARTH project was to treat at least 75 percent of the 9,489 acres needing treatment. The area was divided into cropland, pasture, woodland, gullies, and other land classes. A total of 70% or 6,567 acres were treated using cost share funds (Kenny Wooten, Iron County NRCS, Personal Communication).

The lower subbasin has no planned, ongoing, or completed SALT or EARTH watershed projects. Also, no soil conservation projects authorized by the Watershed Protection and Flood Prevention Act (PL-566 projects) have been planned or completed in either subbasin.

## PUBLIC AREAS

Public ownership in the basin totals more than 218,600 acres, with about 83 percent of the public lands located in the upper subbasin and 17 percent in the lower subbasin. The Mark Twain National Forest (U.S. Forest Service) is the largest public landowner in the upper subbasin with 90,200 acres of scattered upland forest tracts, which contain little permanent water. The MDC owns about 46,800 acres, which includes 28 Conservation Areas that are managed as upland and bottomland forests, waterfowl hunting areas, or stream accesses (Tables 1 and 2). The USCOE project lands around Wappapello Lake total 44,300 acres, and are managed primarily for timber and upland wildlife resources. The USFWS operates the 22,000-acre Mingo National Wildlife Refuge in the lower subbasin as a waterfowl refuge. The MDNR provides multiple recreation opportunities on 15,011 acres in four state parks (Elephant Rocks, St. Joe, Sam A. Baker, Wappapello) in the upper subbasin.

## CORPS OF ENGINEERS 404 JURISDICTION

The St. Francis River basin lies within two USCOE jurisdictions, the St. Louis and Memphis Districts. The St. Louis District is responsible for the upper subbasin, including Wappapello Lake and the operation of Wappapello Dam for the purpose of downstream flood control. The Memphis District is responsible for the waters in the lower subbasin, below Wappapello Dam, but does provide input on water released through the dam. All applications or inquiries regarding 404 permits need to be directed to the appropriate district office:

> St. Louis District USCOE, Regulatory Office, 1222 Spruce Street, St. Louis, MO 63103-2833. Telephone: 314/331-8579
>
> Memphis District USCOE, Regulatory Branch, 167 N. Main Street, Room B-202, Memphis, TN 38103-1894. Telephone: 901/544-3471.

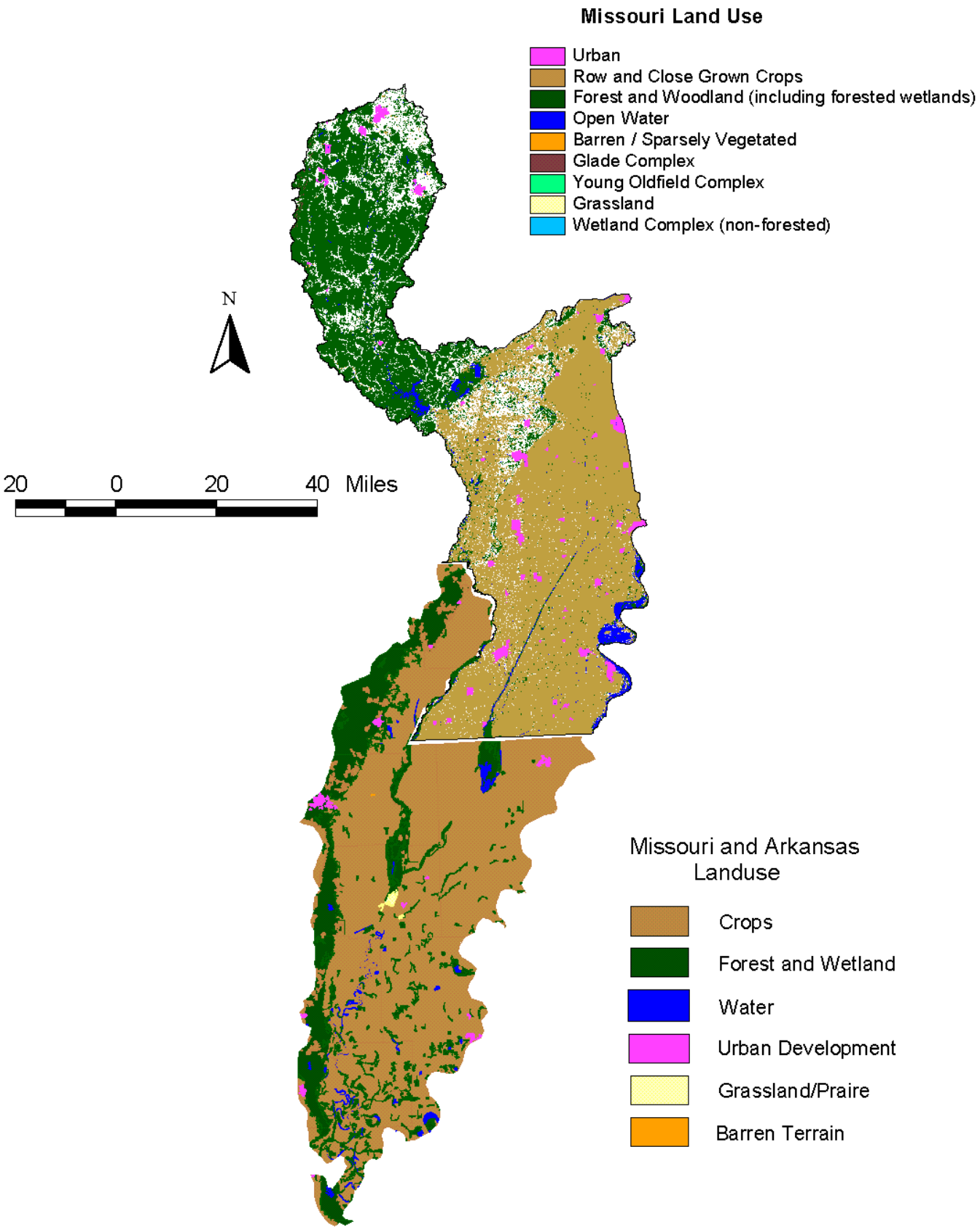


Figure lu. Recent land use in the St. Francis Watershed in Missouri and Arkansas.

**Table 1. Public areas owned by MDC in the upper St. Francis River basin.**

| Public Area | Acres | County |
|---|---|---|
| Bismarck Lake Conservation Area (CA) | 1188 | St. Francois |
| Buck Mountain CA | 194 | St. Francois |
| Buford Mountain CA | 3743 | Iron |
| Coldwater Access | 78 | Wayne |
| Coldwater CA | 7372 | Wayne and Bollinger |
| Flatwoods CA | 909 | Wayne |
| Funk Memorial CA | 180 | Iron |
| Graves Mountain CA | 3678 | Wayne and Iron |
| Gruner Ford Access | 4 | St. Francois |
| Ketcherside Mountain CA | 3356 | Iron |
| Knob Lick Tower Site | 5 | St. Francois |
| Millstream Gardens CA | 684 | Madison |
| Riverside CA | 2528 | Iron, Reynolds, and Wayne |
| Roselle Access | 22 | Madison |
| Silva CA | 236 | Wayne |
| Syenite Access | 29 | St. Francois |
| Thompson Ford Access | 84 | Madison |
| University Forest CA | 7149 | Wayne and Butler |
| Yokum School CA | 160 | Wayne |

**Table 2. Public areas owned by MDC in the lower St. Francis River basin.**

| Public Area | Acres | County |
|---|---|---|
| Ben Cash Memorial Conservation Area (CA) | 1309 | Dunklin |
| Chalk Bluff Trail Access | 82 | Dunklin |
| Duck Creek CA | 6234 | Stoddard and Bollinger |
| Fisk Access | 4 | Butler |
| Frisbee Cutoff Access | 92 | Dunklin |
| Holly Ridge CA | 991 | Stoddard |
| Oak Ridge CA | 243 | Stoddard |
| Otter Slough CA | 4863 | Stoddard and Butler |
| Wilhelmina CA | 1399 | Dunklin and Butler |